

September 2010 Santa Rita Mountains Wild Potato Collecting Trip Report

September 18-25, 2010

Executive Summary

Participants: John Bamberg (B) and Alfonso del Rio (dR)

Concept: Arizona sky islands are noted by Correll as having the most diverse potato germplasm. Santa Ritas have only one previous *fendleri* collection by B as PI 585114 in 1994 (see Appendix).

Preparations: Funding by USDA/ARS/PEO (Appendix). Monitor regional rainfall through spring and summer. Waiver of permit from USFS office in Tucson (see Appendix). Garmin GPSs borrowed from Karen Williams, USDA/ARS/PEO, Beltsville and uploaded tracks and notes from Topo 7 and GoogleEarth tracks. Flights to Tucson and vehicle rental. Conditioning hiking, with weighted packs. Testing of hiking, camping and collecting gear. Reserve lodging at Santa Rita Lodge. GoogleEarth "Coronado Hiking Trails" tracks, GreenTrails map, and custom laminated site map marking points as decimal minutes helped to plan daily hikes.

Results: Hiked 32.5 miles of trails 5300-9440 for total climb of 10K feet to make 22 *fendleri* collections in Sta Rita mountains (RIT) plus three good seed re-collections of 2009 Sta Catalina sites which had been collected as only about 10 plants each. All 2010 sites collected as fruits. Potatoes were particularly abundant and at unexpected low elevation of less than 5300 ft. in RIT. All RIT sites were previously undocumented and uncollected. Three types of potato pests were observed: a fruit fly, a fruit galling insect (see Bamberg et al., 2003. Am J Potato Res 80:159-172), and a leaf-eating beetle (*Leptinotarsa rubiginosa* -- related to Colorado potato beetle), reported here for the first time by these authors on potato. No *S. jamesii* was observed. Exploration of eastern trails probably reduced because rain reduced nights of camping. Moisture and herb groundcover was likely greater than in a typical year. All collections have been assigned PI numbers and added to the NPGS potato collection. Collection #14 was lost (no seeds) but will be one of the easiest locations to revisit and re-collect. Herbarium specimens will be made from regenerants for PTIS and ARIZ.

Deposit of records, materials and files: US Potato Genebank, 4312 Hwy 42, Sturgeon Bay, WI, 54235. 920-743-5406. john.bamberg@ars.usda.gov. GRIN website. PTIS, ARIZ.

TRIP LOG

Note: Coordinates given here are decimals within minute squares within WGS84 31° N Lat x 110° W Lon (see Appendix map "a"). See Appendix for full collection details.

Saturday, September 18th

B dropped off at GRB for 9 AM flight, meeting dR at MSP and continuing to TUS arrival at 12:30 PM. Pick up off-airport Thrifty Dodge *Caliber* vehicle and to Summit Hut for camping gas. La Salsa lunch, Rag'n Sage for coffee, S on interstate 19 to Green Valley. Safeway and Walgreens groceries, batteries, lighters. Arrive Santa Rita Lodge (about 12 miles from Green Valley in Madera Canyon, 464x821 and 4930 ft). Office closed, but key to room taped to the door. Room has kitchen but no phone and cell phones do not work here. Confer & check plan, maps, & equipment.

Sunday, September 19th

Up 6:00, drive from Lodge at 8:00 to SuperBaldy 134 trailhead (\$20 for week), departing 8:12. Find potatoes 8:45. **Collection #1.** Continue to 9:15 where habitat gets too dry and rocky for potato. Cell phone reception at 9:23 at 405x926. At 9:47 at 376x844 & 6480ft, a few small plants without fruit. At 10:00. **Collection #2.** At 10:15 a rest, then a few plants at grassy canyon cutting across path at 147x739 and 6700ft and until 058x800 and 6765 ft. **Collection #3.** Continue on trail to 11:30. **Collection #4.** Arrive at Sprung Spring, which is 0.2 miles from Josephine Saddle trail junctions. Rushing fresh water from a pipe deposited into a large stainless steel catch basin. At 11:50 arrive Josephine Saddle (occasional potatoes all the way from Sprung Spring). This is the best campsite around, but nothing developed. Ring of rocks for fire and logs for seats, very little flat ground for a tent, but plenty of firewood. At 12:30 start down Temporal Gulch trail 595 to McBeth Spring. **Collection #5.** Back to saddle and at 1:45 start down Josephine Canyon trail 138. In 10 minutes walk, trail becomes faint, very dry and gravelly SE-facing slopes, descending fast. Return to saddle. At 2:00 start down Agua Caliente trail. **Collection #6.** Continue until 2:45 where a few small plants observed at informal campsite at 522x210 and 7295ft. At 3:05 few small plants near water seep 604x730 and 7387ft. At 3:34 reach jct with S Vault Mine trail 77 at 937x020 and 7330 ft. Rest, leave jct at 3:45. Very steep decline, seeing nothing until 4:30 at 251x599 and about 6000ft. **Collection #8.** At 5:05 reach Old Baldy trail 372 jct, and 5:11 see a few tiny plants in gravel wash at the picnic sites almost back to parking lot trailhead for SuperBaldy trail 134, at about 5470ft. Drive vehicle back to Lodge. To Green Valley for La Placita Mexican supper. Back to Lodge to plan future hikes in light of rainy weather forecast.

Monday, September 20th

Up 6:30 AM. Breakfast of groceries: tomatoes, broccoli, cheese, boiled eggs, fiber, almonds. To Green Valley and Posada Java Hut for coffee, planning, downloading GPS tracks to laptop. Road to Mt. Hopkins Whipple observatory. **Collection #9.** Continue up toward observatory to roadside pulloff with informal campsite and fire ring. **Collection #10.** To locked observatory gates at 465x798 and 7044ft. where a few stressed plants were observed on both sides of the road. Return to Green Valley for lunch at China Vic restaurant, got more paper collection bags for free at True Value hardware. To Safeway and Starbucks for more food and instant coffee. Return toward Madera Canyon road, but take Whitehouse canyon road to SE to northern trailhead of Florida Canyon trail (at a range management

experiment station). At 1:45 start up Florida Canyon trail 145 which is only about 4330ft. **Collection #11.** At this site seed grub, fruit galls, and potato beetles present. Start return down at 3:00 and reach trailhead at 3:45. To Green Valley for 50's restaurant supper with high wind, thunderstorm and lightning. Decide to abandon plans to camp Tues-Thurs in light of continuing threat of rain.

Tuesday, September 21st

Up at 6:00. To Bog Springs 156 trailhead by 7:20. Up Kent Springs trail 157, observing occasional small plants without fruit all the way to Sylvester spring where a large concrete box contains ample fresh water. **Collection #12.** At 8:30 reach 908x698 and 6100ft where habitat changes to shady big oaks and occasional Ponderosa and ferns in mulchy floor. At 9:00 reach Kent Springs, which was fouled, but there was plenty of fresh water in the creek nearby. This is at jct with Four Springs trail 71. This south side of the loop = Kent Springs trail was along the N-facing side of the canyon so very verdant. Return on the northern loop = Bog Spring 156 trail which is S-facing, so gravelly and dry. At 9:21 see two small plants in trail at 849x449 and 6600ft. At 255x752 and 5980, N-facing to green valley with some small plants along trail. **Collection #13.** To jct with spur to Bog Springs where a few small plants without fruit were observed, then to Bog Spring (drinkable, but not much flow). Just W of the Bog Springs marker sign on W-facing steep slope, in black soil among herb, many potato plants, some with fruit added to collection #13. Back up spur and continue adding to collection #13 until 296x954 at 5760ft, which is about 0.2 miles from Bog Spring. At 10:40 reach Kent Spring trail jct again, proceed back up Kent Springs trail a few hundred feet to primitive road leading SW as shortcut back to Lodge. Some small plants without fruit observed. At 045x259 and 5440ft where stream crosses under road, shady and green grass and herbs, dozens of small plants. Proceed on informal trail W toward paved Madera Canyon road, where, among large grey boulders in creek wash, plants commonly found, sometimes wilted and sometimes with berries. All berries from Bog/Kent trails jct to Madera Canyon road were **Collection #14.** At 11:30 come out at Kubo Lodge on Madera Canyon road and return by road to vehicle.

To Green Valley to La Placita Mexican for lunch, Safeway for groceries, coffee shop. Heavy rain at 2:00; return to Lodge. Sort through fruit for fruitfly scars, extract seeds from those and put clear fruit in refrigerator. Rain forecast makes us decide to drive to Tucson and Santa Catalinas to attempt to recover collections of 2009 made of limited numbers of plants.

Wednesday, September 22nd

Drive to Tucson. Coffee at Le Buzz at jct Tanque Verde and Hitchcock roads. Then up Hitchcock road toward Mt. Lemmon. Cold with dense fog and drizzle at higher elevation. To BdR 196, PI 658184 site near Hitchcock campground. Only a very few small plants could be found this year despite being quite abundant in 2009. To BoyScout Camp site of BdR 197, PI 658249. Skunk with a yogurt cup stuck over his face. **Collection #15.** To Upper Butterfly trailhead site of BdR 195, PI 658183. **Collection #16.** To Mount Lemmon Meadows trailhead site of BdR 194, PI 658182, **Collection #17.**

Return to Tucson. Indian Restaurant on Broadway (not good). Rag'n Sage for coffee. Flooding in Tucson streets. Return to Green Valley and Lodge.

Drive to Dutch John spring trail 91 trailhead and start hiking 3:00 PM. At 673x004 and 5570ft a few large yellowed plants. **Collection #18.** Continue until 3:40 arrival at vicinity of Dutch John spring. **Collection #19.** Start return to trailhead at 3:55, arriving 4:25. Return to Lodge, eat grocery supper and prepare for camping tomorrow.

Thursday, September 23rd.

Up 6:00 and drive to Green Valley to coffee shop, breakfast, get newspaper for campfire, Ramen noodles, return to Lodge and load packs. Drive to Old Baldy 372 trailhead to start hike with packs at 9:00. Robust large plants with mature fruit collected from 9:30 and 446x235 at 6000ft all the way to Josephine Saddle, about 1.8 miles of trail. **Collection #20.**

Arrive Josephine Saddle 11:20. Descend to Sprung Spring (0.2 miles) for water. Make fireplace, set up tents, gather firewood, Asleep at 9:30

Friday, September 24th.

Awake 3:00, 5:00 and up at 6:00. Fire still alive for coffee and breakfast. Two Alleve for back. Leave camp at 7:15 for Mt. Wrightson on Old Baldy. Nice campsite observed just past upper jct with SuperBaldy loop trail around Wrightson. Plants with mature fruits common all the way up to Wrightson saddle, but more so below Bellows Spring. NW-facing slopes, good view of Green Valley and sometimes cell phone reception. Bellows spring good for water but no campsite possible. Very green and oak scrub. Reach crest at Wrightson saddle jct at 9:26. **Collection #21.**

Start for Wrightson peak at 9:45. At jct with Gardner Canyon trail 143 at sheltered campsite (015x837 and 8760ft). Very large plants in grass and under brush with light green leaves and large fruit. At 10:00 reach daisy meadow, N-facing. Plants occasional with fruit collected almost to peak, which was reached at 10:40. **Collection #22.** At 11:00 prepare to depart peak. As dR notes lizard on E-facing rocks among scrub attention is directed to two small fruit on nearby rock, product of two 3-4 inch dried up plants. Another two almost dead tiny plants also here at 748x900 and 9430. **Collection #23.**

Return to trail jcts at 11:55 and split up, B going N up Crest Trail 144 for about 0.8 miles to 8700 ft. The trail runs below the E side of the crest. Mostly small yellow plants with few berries, dry and rocky and burned pines. Exception at a small hilltop at 9060 ft (264x670) under brush, and especially through notch in crest off trail to W at 287x677 and 9060ft. **Collection #24.**

Del Rio goes SE on Gardner 143 to about 0.6 miles from jct to about 853x490 and 8480 ft. **Collection #25.**

Meet at jct at 1:45. Snack. Depart for Josephine Saddle camp at 2:00, arriving at Bellows Spring 2:17 and camp at 3:05. Lunch and coffee, pack up, leaving at 4:07 back down Old Baldy. At 5:08 reach Vault Mine trail jct, and at 5:15 reach vehicle at trailhead. To Lodge, clean up, to Green Valley for La Placita Mexican for grilled shrimp supper. Return to Lodge.

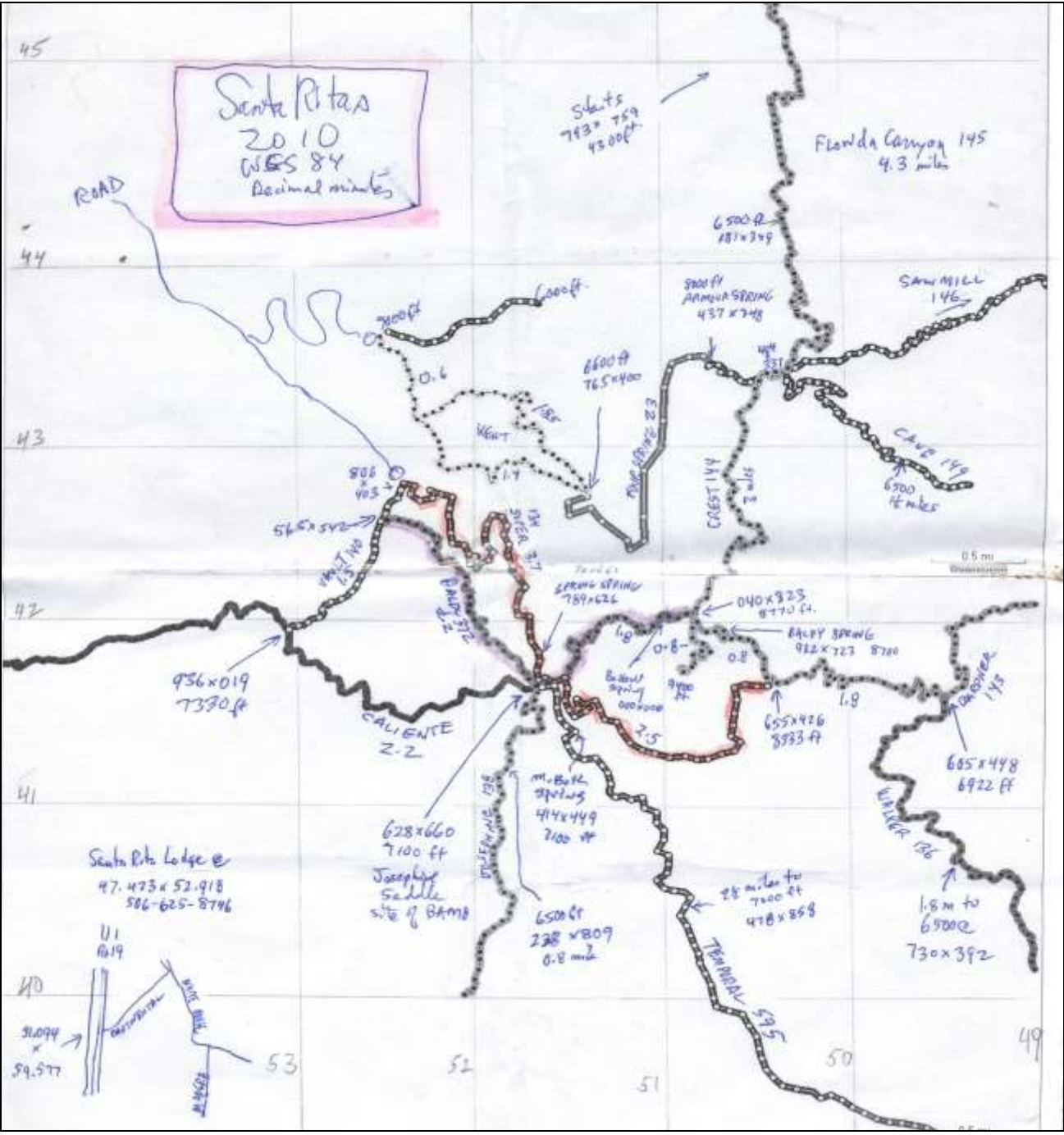
Saturday, September 25th

174 Up 6:00, snack remaining groceries, pack, drive to Tucson and “Eclectic Cafe” breakfast. Return
175 unused gas can to Summit Hut. Gas vehicle. Return to airport.

APPENDIX

Maps

a. Laminated custom map with decimal coordinates of points of interest

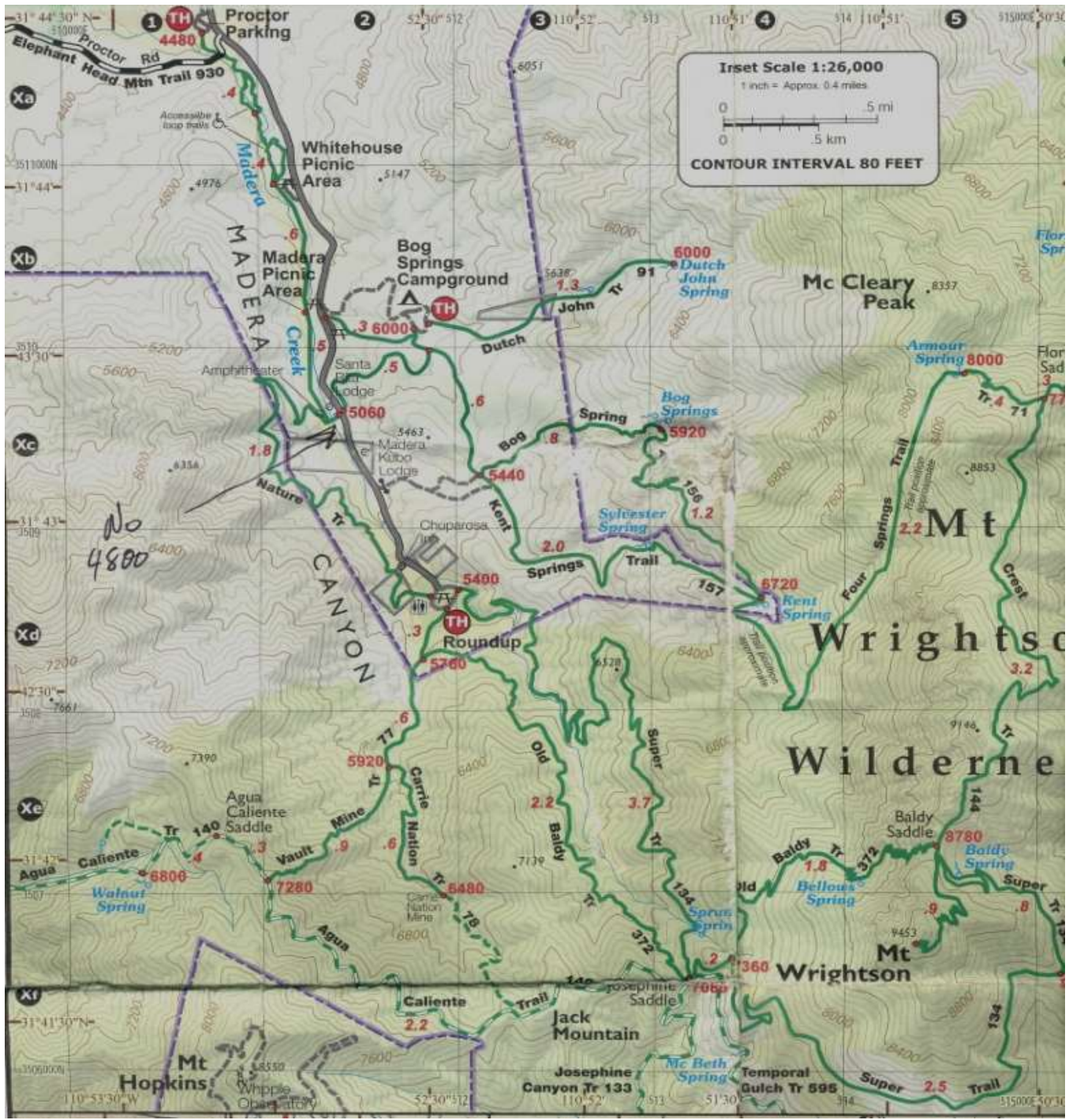


183 b. Collection sites¹



184 ¹ Collections #15, #16, #17 are re-collections of 2009 collections in Santa Catalina Mountains, approx. 50 miles north.
185
186 Santa Rita Lodge is misplaced in GoogleEarth.
187

c. GreenTrails Map¹



¹Some mistakes on this map: Bog springs access is paved to trailhead which is 5060 not 6000ft. Crest trail = 2.4 miles not 3.4. Josephine Canyon Trail is #138 not 133. The road W of Bog/Kent trail jcts is dirt, not gravel.

COLLECTIONS LIST (as numbered in text)**September 2010 Santa Rita mountains Collections of *S. stoloniferum*¹**

660257. BdR 198. *S. stoloniferum*. September 19th, 2010. United States. Arizona. Santa Cruz county. Coronado National Forest. Santa Rita Mountains. Collection #01. SuperBaldy FT 134 between trailhead and Josephine Saddle. Down side of trail where trail meets creek and some paths go down to water. WGS84 31° 42.440'N x 110° 52.050'W. 5900ft. Many dozens of plants, small to large, green to yellowed. Fruit common. Under ponderosas and oak in leaf mulch over gravelly light soil. Collected fruit yielding 950 original seeds.
660258. BdR 199. *S. stoloniferum*. September 19th, 2010. United States. Arizona. Santa Cruz county. Coronado National Forest. Santa Rita Mountains. Collection #02. SuperBaldy FT 134 between trailhead and Josephine Saddle. WGS84 31° 42.337'N x 110° 51.785'W. 6600ft. About 12 large green plants with mature berries. In black soil among rocks in steep rocky slope with many herbs. Collected fruit yielding 503 original seeds.
660259. BdR 200. *S. stoloniferum*. September 19th, 2010. United States. Arizona. Santa Cruz county. Coronado National Forest. Santa Rita Mountains. Collection #03. SuperBaldy FT 134 between trailhead and Josephine Saddle. WGS84 31° 41.995'N x 110° 51.684'W. 6870ft. Large plants, sometimes wilted, occasional under brush. S-facing dry and rocky. Collected fruit yielding 1004 original seeds.
660260. BdR 201. *S. stoloniferum*. September 19th, 2010. United States. Arizona. Santa Cruz county. Coronado National Forest. Santa Rita Mountains. Collection #04. SuperBaldy FT 134 between trailhead and Josephine Saddle. WGS84 31° 41.785'N x 110° 51.636'W. 6980ft. Abundant large plants with large mature berries. Open slope in black moist soil with many green herbs including other Solana. Collected fruit yielding 789 original seeds.
660261. BdR 202. *S. stoloniferum*. September 19th, 2010. United States. Arizona. Santa Cruz county. Coronado National Forest. Santa Rita Mountains. Collection #05. Temporal Gulch FT595. McBeth spring vicinity. WGS84 31° 41.407'N x 110° 51.475'W. 7100ft. A few plants, only two fruit. Under large Douglas firs. Collected fruit yielding 101 original seeds.
660262. BdR 203. *S. stoloniferum*. September 19th, 2010. United States. Arizona. Santa Cruz county. Coronado National Forest. Santa Rita Mountains. Collection #06. Agua Caliente FT140. WGS84 31° 41.596'N x 110° 51.915'W. 7200ft. Many plants, mostly <6 inches with abundant fruit. In rich soil in needles and oak leaf mulch. Collected fruit yielding 691 original seeds.
660263. BdR 204. *S. stoloniferum*. September 19th, 2010. United States. Arizona. Santa Cruz county. Coronado National Forest. Santa Rita Mountains. Collection #07. Agua Caliente FT140. WGS84 31° 41.524'N x 110° 52.525'W. 7300ft. Dozens of plants to 8 inches, many fruit. N-facing slope. Collected fruit yielding 227 original seeds.
660264. BdR 205. *S. stoloniferum*. September 19th, 2010. United States. Arizona. Santa Cruz county. Coronado National Forest. Santa Rita Mountains. Collection #08. Vault Mine FT77 jct Carrie Nation FT78. WGS84 31° 42.277'N x 110° 52.619'W. 5900ft. Many large plants, woody stems and sometime grazed, hiding under brush. Many fruit galls. Collected fruit yielding 481 original seeds.
660265. BdR 206. *S. stoloniferum*. September 20th, 2010. United States. Arizona. Santa Cruz county. Coronado National Forest. Santa Rita Mountains. Collection #09. Mt. Hopkins / Whipple Observatory Road Where triple culverts cross under road. WGS84 31° 40.430'N x 110° 53.480'W. 6160ft. Occasional plants, fruit infrequent. Deep shady valley with water in creek. On rocky, N-facing side of creek. Collected fruit yielding 120 original seeds.

660266. BdR 207. *S. stoloniferum*. September 20th, 2010. United States. Arizona. Santa Cruz county. Coronado National Forest. Santa Rita Mountains. Collection #10. Mt. Hopkins / Whipple Observatory Road Roadside pulloff and campsite. WGS84 31° 40.432'N x 110° 53.087'W. 6540ft. Large plants, but most stressed, few fruit. Grassy and rocky valley descending to creek. Collected fruit yielding 369 original seeds.
660267. BdR 208. *S. stoloniferum*. September 20th, 2010. United States. Arizona. Pima county. Coronado National Forest. Santa Rita Mountains. Collection #11. Florida Canyon FT145. WGS84 31° 44.993'N x 110° 50.289'W. 5270ft. Hundreds of very large, mature plants, sometimes grazed, yellowed, with very large mature fruit. Black moist soil and in leaf mulch and rocks right where creek bed crosses trail. Here observed *Leptinotarsa rubiginosa*, a species related to Colorado potato beetle, first report of feeding on potato. This population is at the lowest elevation reported for this species to date. Collected fruit yielding 1811 original seeds.
660268. BdR 209. *S. stoloniferum*. September 21st, 2010. United States. Arizona. Santa Cruz county. Coronado National Forest. Santa Rita Mountains. Collection #12. Kent Spring FT157. Very close to trail and springbox. WGS84 31° 42.908'N x 110° 51.698'W. 6200ft. Two mature plants with fruit. Under shady big oaks and ponderosa in thick leaf mulch. Collected fruit yielding 136 original seeds.
660269. BdR 210. *S. stoloniferum*. September 21st, 2010. United States. Arizona. Santa Cruz county. Coronado National Forest. Santa Rita Mountains. Collection #13. Bog Spring FT156. WGS84 31° 43.276'N x 110° 51.780'W. 5860ft. Several plants to 10 inches with mature fruit. Shady valley in moist black soil among abundant green herbs. Collected fruit yielding 2311 original seeds.
660270. BdR 211. *S. stoloniferum*. September 21st, 2010. United States. Arizona. Santa Cruz county. Coronado National Forest. Santa Rita Mountains. Collection #14. Between Kent Spring and Bog Spring FT jct and Madera Canyon Road. WGS84 31° 43.069'N x 110° 52.307'W. 5380ft. Occasional plants to 12 inches, sometime wilted. In creek wash among large boulders and grass, and under shade of oaks. Collected fruit yielding 0 original seeds. **LOST**.
660271. BdR 212. *S. stoloniferum*. September 21st, 2010. United States. Arizona. Pima county. Coronado National Forest. Santa Catalina Mountains. Collection #15. Re-collection of BdR 197, PI 658249, Boy Scout Camp. WGS84 32° 24.580'N x 110° 42.968'W. 7900ft. Many large plants with mature fruit. Collected fruit yielding 416 original seeds.
660272. BdR 213. *S. stoloniferum*. September 22nd, 2010. United States. Arizona. Pima county. Coronado National Forest. Santa Catalina Mountains. Collection #16. Re-collection of BdR 195, PI 658183, NW end of Butterfly FT16. WGS84 32° 25.671'N x 110° 44.414'W. 7730ft. Many large plants with mature fruit. Collected fruit yielding 1211 original seeds.
660273. BdR 214. *S. stoloniferum*. September 22nd, 2010. United States. Arizona. Pima county. Coronado National Forest. Santa Catalina Mountains. Collection #17. Re-collection of BdR 194, PI 658182, Mt. Lemmon Summit Parking lot. WGS84 32° 26.437'N x 110° 47.144'W. 9100ft. A few plants to 6 inches with mature and immature fruit. Collected fruit yielding 47 original seeds.
660274. BdR 215. *S. stoloniferum*. September 22nd, 2010. United States. Arizona. Pima county. Coronado National Forest. Santa Rita Mountains. Collection #18. Dutch John Spring FT91. WGS84 31° 43.673'N x 110° 52.004'W. 5550ft. A few large yellowed plants with large fruit. Shady oak valley, in thick mulch and among rocks. Collected fruit yielding 187 original seeds.
660275. BdR 216. *S. stoloniferum*. September 22nd, 2010. United States. Arizona. Pima county. Coronado National Forest. Santa Rita Mountains. Collection #19. Dutch John Spring FT91. WGS84 31° 43.768'N x 110° 51.717'W. 6000ft. About 20 large, mature, yellowed plants with large fruit. S-facing, dark brown soil, many herbs including Solana. Collected fruit yielding 415 original seeds.
660276. BdR 217. *S. stoloniferum*. September 23rd, 2010. United States. Arizona. Santa Cruz county. Coronado National Forest. Santa Rita Mountains. Collection #20. Old Baldy FT372 between trailhead and Josephine Saddle. WGS84 31° 42.021'N x 110° 52.040'W. 6500ft. Abundant, robust plants at all sizes at many

places along this trail, fruits common. N-facing slopes and valleys with lush herbs. Collected fruit yielding 3196 original seeds.

660277. BdR 218. *S. stoloniferum*. September 24th, 2010. United States. Arizona. Santa Cruz county. Coronado National Forest. Santa Rita Mountains. Collection #21. Old Baldy FT372 from Josephine Saddle to jct Crest FT144. WGS84 31° 41.998'N x 110° 51.179'W. 7900ft. Abundant, often very large robust plants with very large leaves and large mature berries, and sometimes with fruit galls. NW-facing slopes, often very green with herbs and grass, oak scrub, thornbushes, ferns, or open daisy fields among burned trees, very black soil. Collected fruit yielding 4080 original seeds.

660278. BdR 219. *S. stoloniferum*. September 24th, 2010. United States. Arizona. Santa Cruz county. Coronado National Forest. Santa Rita Mountains. Collection #22. Near jct Old Baldy FT372 and Crest FT144. WGS84 31° 42.015'N x 110° 50.837'W. 8780ft. Very large plants with light green leaves, mature fruit. Among grass and hiding under brush at campsite. Collected fruit yielding 1330 original seeds.

660279. BdR 220. *S. stoloniferum*. September 24th, 2010. United States. Arizona. Santa Cruz county. Coronado National Forest. Santa Rita Mountains. Collection #23. Mt. Wrightson summit. WGS84 31° 41.748'N x 110° 50.900'W. 9440ft. Two small withered plants with two mature berries deposited on a flat rock just off E edge of trail. In tumbled rock immediately SE of summit. Collected fruit yielding 63 original seeds.

660280. BdR 221. *S. stoloniferum*. September 24th, 2010. United States. Arizona. Santa Cruz county. Coronado National Forest. Santa Rita Mountains. Collection #24. Crest FT144. Where notch in crest allows access to W side. WGS84 31° 42.287'N x 110° 50.678'W. 9060ft. Many very large green plants with mature fruit, some terminal leaflets very large. Steep cliffside in rich soil among rock or hiding under low slung branches in grass. Collected fruit yielding 2350 original seeds.

660281. BdR 222. *S. stoloniferum*. September 24th, 2010. United States. Arizona. Santa Cruz county. Coronado National Forest. Santa Rita Mountains. Collection #25. Gardner Canyon FT143. WGS84 31° 41.851'N x 110° 50.488'W. 8500ft. Mature and young plants, sometimes with berries. In daisy field with burned trees, sometimes hiding under brush in rocky soil. Collected fruit yielding 1215 original seeds.

¹ *stoloniferum* previously known as *fendleri*. BdR = Bamberg, JB, and AH del Rio. Unparasitized fruit had 50-100 seeds but fruit fly grubs were common so many fruit discarded during trip or after returning to the genebank.

POTATO GERMPLASM COLLECTING PROPOSAL 2010

John Bamberg, US Potato Genebank -- August 10, 2010

Target species: *Solanum fendleri* (*stoloniferum*) and *S. jamesii*

Area: Santa Rita Mountains S of Tucson, AZ, Coronado National Forest.

Time: Mid-Sept, 2010 (depending on local conditions)

Duration: about 8-10 days, total

Background: This sky island has been lightly collected in the past, mostly as roadside ("easy") collections. Recent DNA-based studies show that more extensive collections at such sites can significantly expand capture of genetic diversity. We already have FS permission. Rainfall has been particularly good this season.

Objective: Explore trails and other appropriate habitats.

Itinerary: Fly to Tucson, drive to Madera Canyon trailhead, explore highland trails for *fendleri* and appropriate habitats at lower altitudes for *jamesii*.

Participants (US Potato Genebank employees): John Bamberg (USDA/ARS) and Alfonso del Rio (University of Wisconsin)

Funding: Travel support at \$3,500.

Contingency or additional plan: Last year's expedition to the Santa Catalinas brought locations to our attention that would warrant follow-up searching. Specifically, some N-facing slopes were particularly abundant in potatoes, and now knowing the location of reliable springs would make hikes to such sites more than a day away from the trailhead feasible. Similarly, we found abundant potato in Bear Canyon at quite low elevations, suggesting that a multi-day hike from Mt. Lemmon down through ostensibly appropriate habitats in Pusch Ridge and out to Tucson might result in unique accessions. A second alternative would be to scale the Chiricahua escarpment from the south, for shorter, albeit more difficult access to an area identified in recent research as particularly rich in diversity (AJPR 87:277).

Previous Collection

PI 585114. BAM 008. *Solanum stoloniferum*, previously *S. fendleri*. Collected 24-Sep-1994. Arizona, United States by Bamberg. Santa Cruz County. Santa Rita Mountains near Green Valley. Vicinity Mt. Wrightson. From Madera Canyon take Old Baldy Trail about 2 miles to Josephine Saddle. Approximately 31° 41.650'N x 110° 51.670'W at 2700 meters. Abundant but mostly small. Some flowering and mature fruits. Collected about 30 fruit.

Trip costs

Extramural funding by Karen Williams, PEO collecting grant of \$3,500. Formal trip claims of \$612 (dR) and \$2,194 (B) = \$2,806. Time invested was at least 2 weeks (B) and one week (dR) = \$7,100. Total cost ~ \$10K.

Possibilities for future work

We prioritized sites above 6500 ft for exploration as being most likely to be hospitable for potato. When Coll #11 was discovered with one of the most robust populations ever seen by the authors and at the lowest elevation ever reported, we realized that there is much more territory (at lower elevations) in this region that warrants exploration. Also, we would likely have been able to explore more of the trails to the east of the crest if rain had not prevented more nights of camping.

396 **PERMITS** (none needed)
397
398

Bamberg, John

PERMIT

From: James J Sutton [jsutton@fs.fed.us]
Sent: Wednesday, March 03, 2010 10:27 AM
To: Bamberg, John
Cc: Deborah K Sebesta; Duane A Bennett
Subject: Fw: Potato collecting September 2009 update and proposal for 2010 -- Santa Ritas'

Hello John,
The Nogales District will not require a permit for your research. You must carry a copy of the response from Deborah Sebesta in the event that any Forest Service personnel should ask you for permits or documentation.
Prior to coming on the Forest please contact Deborah Sebesta and supply her with all research reports when completed. This is a district heavily impacted with illegal activities and trafficking of non-nationals, check with your agency or the U.S. Border Patrol concerning safety in the field
Thank you,
Jim
James Sutton
Santa Catalina Ranger District
5700 North Sabino Canyon Road
Tucson, AZ 85750
(520) 749-7725
(520) 749-7723 (fax)

----- Forwarded by James J Sutton/R3/USDAFS on 03/03/2010 09:20 AM -----

Deborah K Sebesta/R3/USDAFS

To: James J Sutton/R3/USDAFS@FSNOTES

cc:

03/03/2010 07:54 AM

Subject RE: Potato collecting September 2009 update and proposal for 2010 -- Santa Ritas' [Link](#)

James,
He doesn't need a permit for D2.

Debbie Sebesta, District Biologist
Coronado National Forest
Nogales Ranger District
303 Old Tucson Road
Nogales, AZ 85624
Voice: 520-761-6009
Cell: 520-260-7702
Fax: 520-281-2396
E-mail: dsebesta@fs.fed.us

Ranger Patrick Wasinski
520-343-1866

James J Sutton/R3/USDAFS

To: "Bamberg, John" <John.Bamberg@ARS.USDA.GOV>

cc: Deborah K Sebesta/R3/USDAFS@FSNOTES, Josh Taiz/R3/USDAFS@FSNOTES, Duane A Bennett/R3/USDAFS@FSNOTES

03/02/2010 03:31 PM

Subject RE: Potato collecting September 2009 update and proposal for 2010 -- Santa Ritas' [Link](#)

Pictures



Leptinotarsa rubiginosa (related to Colorado potato beetle) at Coll. #11



On Bog springs trail



Sta. Ritas as seen from W



Coll #16. Butterfly, Sta. Catalinas



SuperBaldy Trail



Mt. Wrightson



Alpine aspect



Fruit galls



Josephine Saddle campsite



Josephine Saddle



Bamberg above McBeth spring



Meadow on ascent to Mt. Wrightson



Crest & SuperBaldy trails jct, Coll# 22



del Rio at Bog Springs



Mt. Wrightson Peak



Upper Baldy trail



Florida Canyon Coll #11 site



Mt. Wrightson Peak



Bellows spring



Mt. Wrightson Peak